

IZUMI

Serial No. 10/520,928

Response to Office Action dated June 15, 2006

RECEIVED
CENTRAL FAX CENTER

AUG 15 2006

REMARKS

Reconsideration and allowance of the subject patent application are respectfully requested.

Claims 22-33 have been withdrawn from consideration. The office action states that claims 1-8 and 14-21 are classified in class 257, subclass 225 and that claims 22-33 are classified in class 257, subclass 233, 258. The office action further states that Applicant has constructively elected claims 1-8 and 14-21.

The restriction is seemingly based on the contention that the restricted claims are drawn to devices containing thin film transistor(s) and a photodiode. See 6/15/2006 Office Action, page 2 ("..Group 1 fails to mention any inclusion of thin film transistors/photodiodes.") However, while certain claims depending from claims 22 and 28 mention thin film transistors/photodiodes, the photoelectric conversion devices of restricted claims 22 and 28 do not mention such elements. Consequently, claims 22 and 28 do not appear to contain the elements on which the restriction is predicated. Claim 32 mentions thin film transistors, but not photodiodes. Applicant respectfully traverses the restriction requirement and submits that the office action fails to set forth an appropriate basis for restricting at least claims 22, 28 and 32. In short, Applicant submits that these claims should not be restricted based on the contents of their dependent claims.

Nothing in this response is an admission (or should be construed as an admission) that claims 22-33 are not patentably distinct from claims 1-8 and 14-21. Applicant simply believes the office action fails to set forth a proper basis for the restriction requirement and reconsideration of this requirement is respectfully requested.

Claims 7, 16 and 20 were rejected under 35 U.S.C. Section 112, second paragraph, as allegedly being indefinite. These claims have been amended as kindly suggested by the Examiner and withdrawal of the Section 112, second paragraph, rejection is respectfully requested.

Claims 1, 2, 5, 6, 8, 14, 15 and 17 were rejected under 35 U.S.C. Section 102(e) as

IZUMI

Serial No. 10/520,928

Response to Office Action dated June 15, 2006

allegedly being anticipated by Choo et al. (U.S. Patent No. 6,617,584).

The office action alleges that Choo et al. discloses the photoelectric conversion devices set forth in independent claims 1 and 2. Specifically, the office action alleges with reference to Figure 7 of Choo et al. that first protective layer 68 and organic insulating layer 72 of Choo et al. correspond to the claimed first insulating layer; gate electrode 56, source electrode 58, drain electrode 60 and active layer 64 of Choo et al. correspond to the claimed photoelectric conversion element; and first auxiliary electrode 90 of Choo et al. corresponds to the claimed connection electrode. Contact hole 78a of Choo et al. is alleged to correspond to the claimed opening portion and transparent electrode 80 of Choo et al. is alleged to be connected to the first auxiliary electrode via the contact hole 78a.

Applicant respectfully submits that there is no disclosure in Choo et al. that the TFT which includes gate electrode 56, source electrode 58, drain electrode 60 and active layer 64 functions as a photoelectric conversion element as alleged in the office action. Specifically, in Choo et al., X-rays are converted to electron-hole pairs by a selenium layer. The electron-hole pair is separated using a high voltage and the holes charge a pixel electrode 34, as shown in Figure 1 and as described in column 1, lines 21-40 of Choo et al. The TFT shown in Figure 1 is simply to discharge the capacitor to the data line in accordance with a gate signal. See Choo et al., col. 1, lines 39-41. Consequently, contrary to the assertion in the office action, none of the elements in Figure 7 of Choo et al. can be said to constitute a photoelectric conversion element. In particular, elements 58, 64, 56 and 60 do not constitute a photoelectric conversion element.

Even assuming a selenium layer is present and is argued to constitute a photoelectric conversion element, it is clear from a comparison of the pixel electrode 34 in Figures 1 and 3 of Choo et al. that the device portion shown in Figure 3 is positioned below the photosensitive selenium layer. Similarly, by comparing Figures 3 and 7, it is clear that the device portion shown in Figure 7 of Choo et al. would also be positioned below a selenium layer. Consequently, first protective layer 68 and organic insulating layer 72 of Choo et al. cannot correspond to the first insulating layer of claims 1 and 2 because the first insulating layer of these claims is required to cover the photoelectric conversion element.

Applicant notes that Figure 1 of Choo et al. shows a dielectric layer 6 above selenium

IZUMI

Serial No. 10/520,928

Response to Office Action dated June 15, 2006

layer 4. However, there is no disclosure of an opening portion in this dielectric layer as required by claim 1 or of an exposing portion of this dielectric layer that exposes at least a part of a connection electrode as required by claim 2.

For at least these reasons, Choo et al. cannot anticipate claim 1 or claim 2. Claims 5, 6 and 8 depend from claim 1 and claims 14, 15 and 17 depend from claim 2. These dependent claims likewise cannot be anticipated by Choo et al.

Claims 3, 4, 18 and 21 were rejected under 35 U.S.C. Section 102(b) as allegedly being "anticipated" by Ikeda et al. (U.S. Patent No. 6,323,490).

The office action alleges with reference to Figure 69 that passivation layer 4310 and organic insulating film 4314 of Ikeda correspond to the claimed first insulating layer; that a-Si layer 4304, gate electrode 4309, stopper layer 4312, and source/drain layer 4316 correspond to the claimed photoconversion element; and capacitor electrode 4305, insulating film 4307 and source electrode 4315 correspond to the claimed pixel capacitor section. Pixel electrode 4311 is alleged to correspond to the claimed conductive layer and the thickness of the insulating layer 4310/4314 is alleged to be thinner in an area positioned on or above the pixel capacitor section than in other areas.

Here again, the TFT formed by a-Si layer 4304, gate electrode 4309, stopper layer 4312, and source/drain layer 4316 is not a photoelectric conversion element. As described in col. 38, line 22 et seq. of Ikeda et al., the TFT formed by elements 4316, 4312, 4309 and 4304 corresponds to a signal read TFT that operates to discharge a capacitor to a signal line in accordance with a gate electrode voltage. See Ikeda et al., col. 11, lines 16-25. Ikeda et al. appears to be similar to Choo et al. in that the pixel electrode 4311 is positioned below the photoconversion element (e.g., a selenium layer). See, e.g., Ikeda, Figures 3, 15 and 23. Consequently, the nominal first insulating layer identified in the office action (i.e., layers 4310/4314) does not cover the photoelectric conversion element as required by claim 3.

Figure 3 of Ikeda et al. shows a dielectric layer above the X ray/charge conversion layer. However, there is no disclosure whatsoever of a thickness of this dielectric layer being thinner in areas on or above a pixel capacitor section as required by claim 3. Consequently, this dielectric

IZUMI

Serial No. 10/520,928

Response to Office Action dated June 15, 2006

layer cannot constitute the claimed first insulating layer.

For at least these reasons, Ikeda et al. cannot anticipate claim 3. Claims 4, 18 and 21 depend from claim 3 and likewise cannot be anticipated by Ikeda et al.

Claims 7, 16 and 20 were rejected under 35 U.S.C. Section 103(a) as allegedly being "obvious" over Choo et al. and Ikeda et al., further in view of Hamamoto et al. (U.S. Patent 6,800,836). Hamamoto et al. is applied in connection with claims 7, 16 and 20 for its alleged disclosure of a conversion layer that converts non-visible light into light. See 6/15/2006 Office Action, page 8 ("...Hamamoto ... teaches ... a conversion layer (3, a scintillator) placed on a photoelectric conversion device that converts incoming X-rays into visible light.")

Page 8 of the office action notes that all photoelectric conversion devices use some sort of X-ray conversion layer. The office action appears to be suggesting (erroneously in Applicant's view) that these layers can simply be interchanged, and from there goes on to assert that such interchanging is obvious. However, even if such interchanging were possible (which it is not as explained below), simply asserting that documents can be combined is not sufficient to establish a *prima facie* case of obviousness. See Section MPEP 2143.02(III).

The proposed motivation for combining Choo et al. and/or Ikeda et al. with Hamamoto et al. is to prevent damage to the pixel cell array. See 6/15/2006 Office Action, page 8. However, there is no evidence that Choo et al. and Ikeda et al. suffer from damage to the pixel cell array. Consequently, there is no basis for asserting that one of ordinary skill would have applied the teachings of Hamamoto et al. to Choo et al. or Ikeda et al. for this purpose.

According to MPEP Section 2143.02(VI):

If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

The operation of Hamamoto et al. cannot be carried out by the devices of Choo et al. and Ikeda et al.; the devices of Choo et al. and Ikeda et al. convert X-rays to charge while the device of Hamamoto et al. involves converting X-rays to light. These are very different operations

IZUMI

Serial No. 10/520,928

Response to Office Action dated June 15, 2006

involving different detection mechanisms. The combination proposed in the office action would require considerable modification of Choo et al. and Ikeda et al. The extent of the modifications would almost certainly require changes to the features that are alleged to correspond to the elements of the claims, so that alleged correspondence set forth in the office action between the claims and the devices of Choo et al. and Ikeda et al. would no longer be present.

For at least these reasons, Applicants respectfully submit that claims 7, 16 and 20 patentably distinguish over the proposed combination of Hamamoto et al. with Choo et al. and Ikeda et al.

Claim 19 was rejected under 35 U.S.C. Section 103(a) as allegedly being "obvious" over Ikeda et al. in view of Choo et al. In particular, Choo et al. is combined with Ikeda et al. to allegedly provide the second insulating layer of claim 19. However, even assuming for the sake of argument that Ikeda et al. were to be provided with a second insulating layer, this would not remedy the deficiencies of Ikeda et al. with respect to claim 3, from which claim 19 depends.

The pending claims are believed to be allowable and favorable office action is respectfully requested.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: Michael J. Shea
Reg. No. 34,725MJS:mjs
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100